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File: USPT

Aug 15, 1989

US-PAT-NO: 4857319

DOCUMENT-IDENTIFIER: US 4857319 A

TITLE: Method for preserving liposomes

DATE-ISSUED: August 15, 1989

## INVENTOR-INFORMATION:

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US-CL-CURRENT: 424/94.1; 424/94.4, 435/26, 435/4, 436/829, 514/2, 514/3, 514/44,  
514/579, 514/646, 514/76, 514/77, 514/78

## CLAIMS:

I claim:

1. A preserved liposomal composition comprising; lyophilizates defining lipid vesicles having an average size of from about 50 nm to about 100 nm, an initial quantity of material being encapsulated by the vesicles, and a disaccharide component being present both interior and exterior to the lipid vesicles, and the disaccharide component being from about 0.1:1 to about 4:1 with respect to the lipid component.
2. The composition as in claim 1 wherein the encapsulated material includes a water-soluble therapeutic agent, a biologically active compound, or a diagnostic agent.
3. The composition as in claim 1 or 2 wherein the disaccharide component is trehalose, maltose, lactose or sucrose.
4. The composition as in claim 3 wherein the lyophilizates are rehydratable with sufficient water as resultant liposomes and the resultant liposomes encapsulate at least about 80% to about 100% of the initial quantity of encapsulated material.
5. The composition as in claim 4 wherein the rehydrated liposomes are about 50 nm in diameter.
6. The composition as in claim 1 wherein the disaccharide preserving agent is trehalose in an amount of from about 1:1 to about 4:1 with respect to the lipid component, and the lipid vesicles of the lyophilizates have a size of about 50 nm.
7. A method for preserving liposomes, comprising: providing initial liposomes formed from one or more lipids and having an average size from about 50 nm to about 100 nm, the initial liposomes encapsulating an initial quantity of biologically active, therapeutic or diagnostic material and a disaccharide preserving agent; contacting said initial liposome with more of the disaccharide preserving agent in an aqueous solution, the total disaccharide preserving agent being in a weight ratio with respect to lipid from about 0.1:1 to about 4:1; and lyophilizing said initial liposome in the presence of the preserving agent to form lyophilizates.
8. The method as in claim 7, further comprising recovering resultant liposomes from said lyophilizates by adding an aqueous solution to said lyophilizates, the resultant liposomes encapsulating at least about 80 wt. % of said initial quantity of encapsulated material.

9. The method as in claim 7 or 8 wherein the disaccharide preserving agent is trehalose, maltose, lactose, or sucrose.
10. The method as in claim 8 wherein the resultant liposomes encapsulate up to 100% of said initial quantity of encapsulated material, and the disaccharide preserving agent is trehalose.
11. The method as in claim 7 or 10 further comprising extruding the initial liposomes before the lyophilizing to a relatively homogeneous size of about 50 nm.
12. A liposomal composition comprising:  
a plurality of liposomes having an average size from about 50 nm to about 100 nm, an initial quantity of material being encapsulated by the liposomes, the liposomes dispersed in a solution, the initial quantity of material and the solution each having a disaccharide component therein, the disaccharide component being from about 0.1:1 to about 4:1 with respect to a lipid component of the liposome.
13. The liposomal composition as in claim 12 wherein the disaccharide component is trehalose, maltose, lactose or sucrose.
14. The liposomal composition as in claim 12 wherein the disaccharide component is trehalose.